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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Docket No. 3043R

PATENT

In re Appellant:

Chamberlin III, et al.

Serial No: 09/727,622

Art Unit: 3747

Filed: December 01, 2000

Examiner: Hai H. Huynh

For: METHOD OF OPERATING AN INTERNAL COMBUSTION ENGINE

APPEAL BRIEF

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313

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TECHNOLOGY CENTER R3700

Dear Sir:

This Appeal Brief is submitted, in triplicate, in the above-identified application in response to the final Office Action mailed January 07, 2004. Appellant's Notice of Appeal was mailed on March 24, 2004 and received in OIPE on March 28, 2004. Accordingly, Appellant's Appeal Brief is timely filed, with no extension of time.

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Dear Sir:

This Appeal Brief is submitted, in triplicate, in the above-identified application in response to the Office Action mailed January 07, 2004, in furtherance of the Notice of Appeal which was mailed on March 24, 2004.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is THE LUBRIZOL CORPORATION, 29400 Lakeland Boulevard, Wickliffe, Ohio, 44092.

II. RELATED APPEALS AND INTERFERENCES

Appellant is aware of no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-44 are pending in the Application. Claims 1, 3-9 and 13-41 are under consideration and stand finally rejected. Claims 2, 10-12 and 42-44 have been withdrawn from consideration. Appellants bring this appeal against the rejection of claims 1, 3-9 and 13-41. The Appendix contains a copy of all of claims 1, 3-9 and 13-41 involved in this appeal, pursuant to 37 CFR 1.192(c)(9).

IV. STATUS OF AMENDMENT

An amendment under 37 C.F.R. 1.116(a) was filed in this application, and the Examiner issued an Advisory Action. Thus, at the present time, there is no amendment pending.

V. SUMMARY OF INVENTION

Appellant's invention, in one embodiment, relates to a method of operating a camless internal combustion engine, including: (A) operating said engine using a normally liquid or gaseous fuel composition; and (B) lubricating said engine using a low-phosphorus or phosphorus-free lubricating oil composition, said low-phosphorus or phosphorus-free lubricating oil composition optionally containing an extreme-pressure additive comprised of metal and phosphorus, provided the amount of phosphorus contributed to said low-phosphorus or phosphorus-free lubricating oil composition by said extreme-pressure additive does not exceed about 0.08% by weight based on the weight of said low-phosphorus or phosphorus-free lubricating oil composition. In one embodiment, the low-phosphorus or phosphorus-free lubricating oil composition comprises an acylated nitrogen-containing compound having a substituent of at least about 10 aliphatic carbon atoms.

Appellants' invention addresses several problems in the art, as discussed in the specification at pages 1-3. First, Appellants' invention addresses the problems resulting from the presence of metal and phosphorus when a single lubricating oil is used both in the crankcase and in high wear areas of conventional internal combustion engines with

exhaust gas aftertreatment devices such as catalytic converters, particulate traps, catalyzed traps, etc. Because these oils are used in high wear areas they usually contain extreme pressure (EP) agents, which usually contain metal and phosphorus. However, since the oils are also used in the crankcase, during the operation of the engine, these EP agents decompose and the resulting decomposition products eventually enter the aftertreatment device and often contribute to damaging the aftertreatment device.

Second, Appellants' invention addresses the problems resulting from blow-by exhaust gases generated in the crankcase of the engine coming into contact with the valve train of conventional internal combustion engines. Blow-by exhaust gases have been found to be a primary factor affecting valve train wear.

Third, in one embodiment, Appellants' invention addresses the problem of extending the time interval between engine oil changes, which is generally considerably less time than for other maintenance such as air filter changes, coolant changes, brake relining, etc.

The present invention provides a solution to these problems. With the present invention, lubricating oil compositions characterized by a low-level or absence of EP agents containing metal and phosphorus are used in the engine and as a result the exhaust gas aftertreatment device is protected from harmful exposure to the decomposition products of these EP agents. With the present invention, the engines used with the inventive method are camless engines, so there is no cam shaft or other associated parts that can be damaged by blow-by exhaust gases. In accordance with one embodiment of the invention, the required oil change intervals for these engines are extended due to the fact that used engine oil is continuously or periodically removed from the engine, is either combined with fuel fed to the engine and consumed with the fuel, or combined with exhaust gas from the engine and removed therewith, and replaced with new oil.

VI. ISSUE ON APPEAL

The claims on appeal stand rejected under 35 U.S.C. § 103(a). The issue in this appeal is:

APPELLANTS' CLAIMS 1, 3-9 and 13-41 WOULD NOT HAVE BEEN OBVIOUS OVER, AND HENCE ARE PATENTABLE OVER, SCHECHTER, U.S. PATENT NO. 5,456,222 IN VIEW OF MANKA ET AL., U.S. PATENT NO. 5,834,407.

VII. GROUPING OF CLAIMS

Appellant's claims stand or fall together.

VIII. ARGUMENT

A. Both Schechter, U.S. Patent No. 5,456,222, And Manka et al., U.S. Patent No. 5,834,407, Fail to Disclose Any Suggestion or to Provide Any Motivation for Making the Asserted Combination; Examiner Failed to Show Evidence of a Motivation; Examiner Failed to Show a Reasonable Probability of Success; Therefore, Claims 1, 3-9 and 13-41 Would Not Have Been Obvious Over, and Hence Are Patentable Over, These References.

Claims 1, 3-9 and 13-41 stand rejected under 103(a) as obvious over Schechter, U.S. Patent No. 5,456,222, in view of Manka et al., U.S. Patent No. 5,834,407. The Examiner contends that Schechter teaches a method for operating a camless internal combustion engine, that Manka et al. teaches a low-phosphorus or phosphorus-free lubricating oil composition for an engine. The Examiner concludes that it would have been obvious to combine these teachings, based on the Examiner's contention that it would have been "an obvious matter of design choice to use the low-phosphorus lubricating oil composition on the camless engine to reduce wear and exhaust gas emissions because of the low amount of phosphorus."

Appellants respectfully submit that the Examiner has failed to carry the requisite burden of setting forth a *prima facie* case of obviousness, that the rejections of Appellants' claims are improper and that the rejections should be reversed, for at least the reasons set forth in the following.

In summary, as will be shown in detail in the following, Appellants submit that the asserted combination of references does not provide the requisite motivation, that the Examiner has failed to show any evidence of such motivation, and that therefore, the

disclosures of the references cannot properly be combined in accordance with the law of obviousness to yield Appellant's claimed invention as asserted by the Examiner. Appellants respectfully submit that this is a classic case in which the obviousness rejection is based on nothing more than the mere existence in the prior art of the claimed elements which, absent even a scintilla of evidence of the requisite motivation or suggestion to combine, the Examiner has asserted would have been obvious to combine. The Examiner has done nothing more than locate parts of the claimed invention in the prior art. The Examiner has failed to provide any evidence, other than a conclusory assertion, to support either the alleged motivation to combine or a reasonable expectation of success, both of which are required to be shown for a *prima facie* case of obviousness of the claimed combination to be shown. This is an improper rejection. For these reasons, the Examiner's rejection of Appellants' claims 1, 3-9 and 13-41 cannot stand and should be reversed.

(1) The Rejection.

In rejecting Appellants' claims, the Examiner stated that Schechter teaches a method for operating a camless internal combustion engine. The Examiner stated that Manka et al. teaches a low-phosphorus or phosphorus-free lubricating oil composition for an engine containing an extreme pressure additive comprised of metal and phosphorus, provided the amount of phosphorus contributed to the low-phosphorus or phosphorus-free lubricating composition by the extreme-pressure additive does not exceed about 0.08% by weight based on the weight of the low-phosphorus or phosphorus-free lubricating oil composition, citing columns 10, 15 and 28.

Finally, having assembled the selected disclosures from the prior art in order to allegedly find all of the elements of Appellant's claimed invention, the Examiner stated in wholly conclusory fashion:

It would have been an obvious matter of design choice to use the low-phosphorus lubricating oil composition on the camless

engine to reduce wear and exhaust gas emissions because of the low amount of phosphorus.

The Examiner provided no evidence in support of this conclusory statement. The conclusory statement of the asserted motivation and the lack of any factual basis therefor render the rejection deficient, clearly erroneous and legally faulty. The rejection should be reversed.

(2) Schechter.

Schechter relates to a spool valve control on an electro-hydraulic camless valve train. Schechter is discussed in Appellants' specification at page 13, lines 4-12. Schechter teaches that the spool valve provides control of high and low pressure hydraulic fluid supplied to and drawn from the hydraulic engine valve in a camless engine.

Schechter does not teach, mention or suggest use of any lubricating composition in the internal combustion engine. Schechter is only concerned with reducing the cost and complexity associated with the use of hydraulic engine valves, such as the requirement for two solenoid valves per engine valve. Schechter solves the problem by the use of a single spool valve to control each engine valve. Schechter is silent about any particular lubricant used for the engine. Schechter does not disclose or suggest any lubricant and, in fact, the term "lubricant" (and other related terms) does not occur in the disclosure of Schechter. The only mention of "oil" is with respect to the hydraulic fluid used to actuate the valves.

(3) Manka et al.

Manka et al. relates to a lubricating oil composition comprising a major amount of an oil of lubricating viscosity and a minor amount of a certain heterocyclic compound. Manka et al. seeks to solve the problem associated with the use of zinc dithiophosphate in engine oils. Manka et al. teaches that the zinc dithiophosphates can result in deactivation of emission control catalysts used in automotive exhaust systems.

Manka et al teach that the lubricating compositions disclosed therein are useful in reducing the amount of zinc dithiophosphate in engine oils. Manka et al. teach that the

presence of zinc dithiophosphate may have a negative effect on the emission control systems of automotive engines. Manka et al. seek to solve the problem by providing a low-phosphorus or no phosphorus lubricating oil which provides for the antiwear properties lost by removing zinc dithiophosphates from the lubricating composition. Manka et al. discloses nothing more than a particular lubricating composition. Manka et al. includes no disclosure or suggestion of any kind to indicate that the low phosphorus lubricant disclosed therein would be any more useful in a camless engine than would any other lubricant.

Manka et al. is concerned with the catalytic emission control system of a standard internal combustion engine and not with a camless engine. There is no mention of a camless engine in Manka et al. There is no motivation or suggestion or other guidance in Manka et al. that would lead a person of ordinary skill in the art to select the lubricant of Manka et al. for use in a camless engine.

B. The Examiner Failed to State a Legally Proper *Prima Facie* Case of Obviousness.

The Examiner has failed to carry the burden of factually supporting the asserted *prima facie* obviousness, as required under MPEP §2142. The rejection set forth in the present case fails to comport with the law. The rejection fails to state a legally correct *prima facie* case of obviousness. Two of the legally required elements of a *prima facie* case of obviousness, motivation to combine and reasonable probability of success, are absent in this case. Therefore, Appellants respectfully traverse this rejection, and respectfully request the Board reverse the rejections of Appellants' claims, which cannot stand.

Schechter fails to provide any motivation or suggestion to use any particular lubricant with the disclosed camless engine, much less to suggest that the person of ordinary skill in the art should select a low-phosphate lubricant, in particular, for use with the camless engine with which Schechter is concerned. Manka et al. fails to provide any suggestion or motivation to use the particular lubricant disclosed therein specifically in a camless engine. Appellant respectfully submits that the only way to make this combination

is by means of improper hindsight reconstruction of Appellant's invention, using Appellant's disclosure and claims as a guide.

In setting forth the rejection and attempting to show a motivation to make the asserted combination, following the brief recitation of the disclosure of the cited references, the Examiner set forth his contention as to motivation. The entire statement of the rejection (in the final Office Action) is set forth here, in order to emphasize the deficient showing made by the Examiner:

Schechter teaches a method for operating a camless internal combustion engine. Manka et al teach a low-phosphorus or phosphorus-free lubricating oil composition for an engine containing an extreme-pressure additive comprised of metal and phosphorus, provided the amount of phosphorus contributed to the low-phosphorus or phosphorus-free lubricating oil composition by the extreme-pressure additive does not exceed about 0.08% by weight based on the weight of the low-phosphorus or phosphorus-free lubricating oil composition (See col. 10, 15 and 28).

It would have been an obvious matter of design choice to use the low-phosphorus lubricating oil composition on the camless engine to reduce wear and exhaust gas emissions because of the low amount of phosphorus.

Office Action mailed January 7, 2004, pp. 2-3.

In setting forth the rejection in the previous Office Action, after making substantially the same assertions about the cited references, the Examiner offered up substantially the same contention as to motivation:

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the low-phosphorus lubricating oil composition in the engine of Schechter as taught by Manka et al in order to reduce wear, noise and exhaust emissions.

Office Action mailed July 14, 2003, pp. 2-3.

When all the excess verbiage is removed, the Examiner's sole basis for the asserted motivation, in the first Office Action was "in order to reduce wear, noise and exhaust emissions", while in the final Office Action, it was even more brief, "to reduce wear and exhaust gas emissions because of the low amount of phosphorus."

The Examiner at no time made any attempt to show factual evidence in support of these wholly conclusory contentions as to motivation to combine.

The motivations contended by the Examiner amount to no more motivation than *any* person of ordinary skill in the art would have to use *any* engine and *any* lubricant. There is *nothing* in this statement showing why a person of ordinary skill in the art would have selected the camless engine of Schechter and would have then selected the low-phosphorus lubricating composition of Manka et al., from all of the engine types and the virtually countless lubricant types that were available at the time the invention was made.

Perhaps the Examiner would assert that, given the existence of the Manka et al. low-phosphorus lubricating composition, it would be obvious to try this composition in a camless engine such as that of Schechter. "Obvious to try" has long been held not to constitute obviousness. *In re O'Farrell*, 7 USPQ2d 1673, 1680-81 (Fed. Cir. 1988). "Obvious to try" does not mean there is a "reasonable expectation of success". A reasonable expectation of success should not be confused with the understandable "hope to succeed".

Thus, the Examiner's asserted motivation to combine the teachings of the cited references is baseless and the rejection is therefore without proper basis in law. In addition, failing to show a motivation, the Examiner cannot have shown a reasonable expectation of success.

Furthermore, the Examiner failed to show any facts in support of the required showing of a reasonable expectation of success. The Examiner merely selected components without showing any evidence of how a person of skill in the art could derive a reasonable expectation of success in the asserted selection and combination of components.

Since the Examiner has clearly failed on these points, Appellants respectfully submit that the Examiner failed to state either a factually or a legally correct *prima facie* case of obviousness.

In order to establish a *prima facie* case of obviousness, the Examiner must establish: (1) some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) a reasonable expectation of success; and (3) that the prior art references must teach or suggest all the claim limitations. See MPEP 706.02(j)). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not be based on the applicant's (or appellant's) disclosure. *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991).

In the present rejections, the Examiner merely selected the cited references and then concluded that the components of the selected references can be combined so as to have rendered Appellants' claims obvious. These are, therefore, improper rejections.

As set forth in MPEP §2143.01:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

In the present rejections, the Examiner failed to show any proper motivation for, or the desirability of, making the asserted combinations of features recited in Appellants' claims. These are, therefore, improper rejections.

As noted above, the Examiner has failed to provide any *factual evidence* in support of the contention that the requisite motivation exists to make the claimed combination, as an element of a *prima facie* case of obviousness. As the Federal Circuit has noted:

Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a

showing of the teaching or motivation to combine prior art references.

* * *

Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight.

* * *

Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence."

In re Dembiczak, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

Appellants respectfully submit that the Examiner failed to carry the burden of showing a *prima facie* case of obviousness in the present case. Accordingly, Appellant respectfully submits that the Examiner erred as a matter of law in concluding that the claimed invention would have been obvious to one of ordinary skill in the art under section 103.

C. The Examiner Failed to Rebut Appellant's Arguments.

(1) The Final Office Action.

In the section of the final Office Action headed "Response to Appellant's Arguments" the Examiner attempted to rebut Appellant's argument that the Examiner had failed to show any evidence of a motivation to combine. After acknowledging his responsibility and duty to provide such evidence, the Examiner stated:

In this case, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the low-phosphorus lubricating oil composition in the electro-hydraulic actuator of a camless engine in order to reduce wear, noise and emissions because the low-phosphorus amount in the lubricating oil composition. (*sic*, emphasis added.)

In response, Appellants argued that the underlined words fail to provide any factual showing of the requisite motivation to combine. Appellants argued that the Examiner failed to provide any explanation at all regarding how the low phosphorus content of the

lubricating oil composition of Manka et al. would provide the asserted benefits of reduced wear, noise and emissions, and failed to make any factual showing or even assertion as to why a person would select the lubricating oil composition of Manka et al. over the uncountable number of other lubricating oil compositions, many of which are likely to be low in phosphorus, available at the time the invention was made.

Appellants pointed out that the Examiner had failed to make the required factual showing of a motivation to support the obviousness rejection. Appellants argued that the Examiner had simply stated in conclusory fashion with no supporting facts that it would have been obvious to make the asserted combination, and that this conclusory assertion is wholly inadequate to satisfy the legal test required to reject claims for obviousness.

Appellants argued then, as now, that based on the foregoing, the rejections cannot stand, since the Examiner has not stated a legally correct *prima facie* case of obviousness.

(2) The Advisory Action.

Similarly, in the Advisory Action mailed August 27, 2003, the Examiner simply restated his previous contention, again in conclusory fashion with no attempt to cite any evidence in support:

It would have been an obvious matter of design choice to use the low-phosphorus lubricating oil composition on the camless engine to reduce wear and exhaust gas emissions.

Thus, the Examiner has completely failed to even attempt to rebut Appellants' arguments. For this additional reason, the rejection of Appellant's claims is erroneous and should be reversed. Accordingly, Appellant respectfully requests the Board to reverse the Examiner's rejections.

IX. CONCLUSION

For all these reasons, the rejection of Appellant's claims 1, 3-9 and 13-31 under 35 U.S.C. §103(a) should be reversed because the asserted combination of references would

not have rendered obvious Appellants' claimed invention at the time the invention was made. Appellants respectfully request reversal of the Examiner's rejections of Appellants' claimed invention under Section 103(a).

In the event issues remain in the prosecution of this application, Appellants request that the Examiner telephone the undersigned attorney to expedite consideration and/or allowance of the application. Should a Petition for Extension of Time be necessary for the present Appeal Brief to be timely filed (or if such a petition has been made and an additional extension is necessary) petition therefor is hereby made and, if any additional fees are required for the filing of this paper, the Commissioner is authorized to charge those fees to Deposit Account #12-2275, Docket No. 3043R.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR



Date: May 24, 2004

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APPENDIX:

CLAIMS ON APPEAL

1. (Previously presented) A method of operating a camless internal combustion engine, comprising:

(A) operating said engine using a normally liquid or gaseous fuel composition; and

(B) lubricating said engine using a low-phosphorus or phosphorus-free lubricating oil composition, said low-phosphorus or phosphorus-free lubricating oil composition optionally containing an extreme-pressure additive comprised of metal and phosphorus, provided the amount of phosphorus contributed to said low-phosphorus or phosphorus-free lubricating oil composition by said extreme-pressure additive does not exceed about 0.08% by weight based on the weight of said low-phosphorus or phosphorus-free lubricating oil composition.

3. (Original) The method of claim 1 wherein said engine is comprised of a camless valve train.

4. (Original) The method of claim 1 wherein the intake and exhaust valves employed with said engine are electrically actuated, hydraulically actuated, or electrohydraulically actuated.

5. (Original) The method of claim 1 wherein each intake and exhaust valve employed with said engine can vary its lift schedule for various engine operating conditions.

6. (Original) The method of claim 1 wherein said engine comprises from 1 to about 12 cylinders.

7. (Original) The method of claim 1 wherein said engine comprises about 4 to about 8 cylinders.

8. (Original) The method of claim 1 wherein said engine has 2 to about 6 valves per cylinder.

9. (Original) The method of claim 1 wherein said engine has one or two intake valves and one or two exhaust valves per cylinder.

13. (Original) The method of claim 1 wherein said engine is a compression-ignition engine.

14. (Original) The method of claim 1 wherein said fuel composition is a diesel fuel composition.

15. (Original) The method of claim 1 wherein said fuel composition is a low sulfur diesel fuel composition.

16. (Original) The method of claim 1 wherein said engine is a spark ignition engine equipped with an exhaust gas aftertreatment device.

17. (Original) The method of claim 1 wherein said fuel composition is a gasoline fuel composition.

18. (Original) The method of claim 1 wherein said fuel composition is an unleaded gasoline fuel composition.

19. (Original) The method of claim 1 wherein said fuel composition is a gasoline fuel composition having a sulfur content of up to about 300 ppm.

20. (Original) The method of claim 1 wherein said fuel composition is a gasoline fuel composition having a chlorine content of no more than about 10 ppm.

21. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition is comprised of components that add only C, H, O or N, and optionally Si to said composition.

22. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition has a viscosity of up to about 16.3 cSt at 100°C.

23. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition has an SAE Viscosity Grade of 0W, 0W-20, 0W-30, 0W-40, 0W-50, 0W-60, 5W, 5W-20, 5W-30, 5W-40, 5W-50, 5W-60, 10W, 10W-20, 10W-30, 10W-40 or 10W-50.

24. (Original) The composition of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition has a high-temperature/high-shear viscosity at 150°C of up to about 4 centipoise.

25. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition is comprised of a mineral base oil.

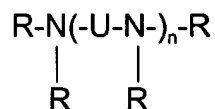
26. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition is comprised of a poly-alpha-olefin base oil.

27. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition is comprised of an acylated nitrogen-containing compound having a substituent of at least about 10 aliphatic carbon atoms.

28. (Original) The method of claim 27 wherein said acylated nitrogen-containing compound is derived from a carboxylic acylating agent and at least one amino compound

containing at least one -NH- group, said acylating agent being linked to said amino compound through an imido, amido, amidine or salt linkage.

29. (Original) The method of claim 28 wherein said amino compound is an alkylenepolyamine represented by the formula:



wherein U is an alkylene group of from about 2 to about 10 carbon atoms; each R is independently a hydrogen atom, a hydrocarbyl group, a hydroxy-substituted hydrocarbyl group, or an amine-substituted hydrocarbyl group containing up to about 30 carbon atoms, with the proviso that at least one R is a hydrogen atom; and n is 1 to about 10.

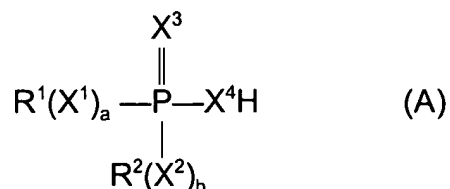
30. (Original) The method of claim 28 wherein said amino compound is an alkylenepolyamine of 2 to about 8 amino groups.

31. (Original) The method of claim 28 wherein said carboxylic acylating agent is a mono- or polycarboxylic acid or anhydride containing an aliphatic hydrocarbyl substituent of at least about 30 carbon atoms.

32. (Original) The method of claim 27 wherein said acylated nitrogen-containing compound is a polyisobutene substituted succinimide containing at least about 50 aliphatic carbon atoms in the polyisobutene group.

33. (Original) The method of claim 27 wherein said acylated nitrogen-containing compound has a chlorine content of no more than about 50 ppm.

34. (Previously Presented) The method of claim 1 wherein said extreme-pressure additive is a compound represented by the formula



wherein in Formula (A), X^1 , X^2 and X^3 and X^4 are independently O or S, a and b are independently zero or 1, and R^1 and R^2 are independently hydrocarbonyl groups, provided the amount of phosphorus contributed to said first lubricating oil composition by said salt does not exceed about 0.04% by weight based on the weight of said first lubricating oil composition.

35. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition is characterized by the absence of an extreme-pressure additive comprised of metal and phosphorus.

36. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition is a low-ash lubricating oil composition which further comprises an ash-producing detergent or dispersant.

37. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition is characterized by the absence of an ash-producing detergent or dispersant.

38. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition is comprised of at least one ashless detergent or dispersant, corrosion-inhibiting agent, antioxidant, viscosity modifier, pour point depressant, friction modifier, fluidity modifier, or anti-foam agent.

39. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition has a sulfur content of no more than about 250 ppm.

40. (Original) The method of claim 1 wherein said low-phosphorus or phosphorus-free lubricating oil composition has a chlorine content of no more than about 10 ppm.

41. (Previously presented) A method of operating a camless internal combustion engine, comprising:

(A) operating said engine using a normally liquid hydrocarbon fuel composition; and

(B) lubricating said engine using a low-phosphorus or phosphorus-free lubricating oil composition, said low-phosphorus or phosphorus-free lubricating oil composition comprising an acylated nitrogen-containing compound having a substituent of at least about 10 aliphatic carbon atoms; said low-phosphorus or phosphorus-free lubricating oil composition optionally containing an extreme-pressure additive comprised of metal and phosphorus, provided the amount of phosphorus contributed to said low-phosphorus or phosphorus-free lubricating oil composition by said extreme-pressure additive does not exceed about 0.08% by weight based on the weight of said low-phosphorus or phosphorus-free lubricating oil composition.